**INTER-AMERICAN DEVELOPMENT BANK**

**GUYANA**

**Strengthening the Environmental Sector II**

**GY-L1043**

**IMPACT ASSESSMENT DESIGN**

**And Revised Terms of Reference for the Impact Evaluation**

**November 2014**

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**Acronyms**

|  |  |
| --- | --- |
| CIDA | Canadian International Development Agency |
| IIC | Inter-American Investment Corporation |
| OC | Ordinary Capital |
| IFA | Integrated Fiduciary Assessment |
| IMF | International Monetary Fund |
| FSO | Fund for Special Operations |
| MIF | Multilateral Investment Fund |
| GPL | Guyana Power & Light |
| GRIF | Guyana REDD+ Investment Fund |
| FDI | Foreign Direct Investment |
| LCDS | Low Carbon Development Strategy |
| MSME | Micro, small and medium-sized enterprises |
| MoU | Memorandum of understanding between Guyana and Norway. |
| DSF | Debt sustainability framework |
| PAHO | Pan American Health Organization |
| PEFA | Public Expenditure and Financial Accountability Program |
| GDP | Gross domestic product |
| UNDP | United Nations Development Programme |
| SME | Small and medium-sized enterprises |
| REDD+ | Reducing emissions from deforestation and forest degradation |
| SCF | Structured and Corporate Financing Department |
| PBA | Improved performance based allocation system |
| EU | European Union |
|  |  |

**GUYANA**

**Strengthening the Environmental Sector II**

**GY-L1043**

**Impact Assessment Design**

# Introduction: Intervention Guidelines

* 1. *Background.* The economic structure of Guyana exhibits a noticeable dependency on its natural resources. As part of the Low Carbon Development Strategy (LCDS), approved in 2009 and amended in 2013, the Government of Guyana is highlighting the importance of environmental protection for long-term sustainable development. The strategy has three important components: (i) financing low carbon emission strategies with the majority of the financial resources being provided through the Memorandum of Understanding (hereinafter MoU) signed between the governments of Norway and Guyana in 2009, in which the government of Norway commits to providing US$ 250 million in 2015, which will be managed within the framework of the Guyana REDD+ Investment Fund; (ii) the creation of a low carbon emission economy, including applying reforms to the forest and mining sectors; and (iii) developing an economy resistant to the effects of climate change through prioritized investment in infrastructure.
  2. *Objectives and description of the Program.* The objective of this second operation of the programmatic series is to continue the process of strengthening the governance and policy framework that supports the implementation of the Low Carbon Development Strategy (LCDS) started with the first operation in this PBP series (Loan 3106/BL-GY). This operation will further enhance the regulatory, institutional and monitoring structures to support the implementation of that strategy.
  3. The first operation in the PBP series (Loan 3106/BL-GY) was approved on December 4th, 2013 for US$16.92M. The first operation focused on the following policy actions: (i) strengthening the regulatory apparatus supporting the implementation of the LCDS; (ii) undertaking internal institutional arrangements to build up working networks to support the long-term implementation of the LCDS; and (iii) fostering the adoption of technology tools to improve oversight of sector agencies and their activities
  4. The second PBP operation is expected to build upon progress made on the first, and support GoG efforts in the following areas: (i) investment in areas that have been identified as priority, in particular, projects directed towards furthering public outreach, consultation and participation, including financing for initiatives that aim at implementing the LCDS by Amerindian communities; (ii) a strengthening of the regulatory framework to improve the environmental behavior of extractive industries, particularly the ratification of the Minamata Convention, as well as the drafting of a National Action Plan to implement the Convention and the amendment and additional regulations to the Mining Act; (iii) progress in the issuance of guidelines for forestry operators, particularly the issuance of the 3rd edition of the Code of Forest Operations for small and large operators, and the reform of the log tracking system to introduce electronic bar codes; (iv) generation of a strategy to facilitate benefit-sharing by indigenous communities of economic activities taking place in their lands –an Opt-In mechanism; (v) approval of national and regional land use plans; (vi) a strengthening of the regulatory framework of the Environmental Protection Agency (EPA); (vii) consolidation of the regulatory framework that guides the relations between the MNRE and GGMC and GFC; (viii) continuation of the institutional strengthening efforts, with emphasis on transparency in revenue management (support for the implementation of the Extractive Industries Transparency Initiative); supervision and impact management for law enforcement (incentivizing the use of clean technologies in the mining sector, land management information systems); application of instruments (accreditation and certification with internationally recognized systems) directed towards improving the environmental sustainability of extractive industries; and (ix) continuous reporting on the impacts of deforestation and forest degradation drivers as part of the Monitoring, Reporting and Verification System MRVS).
  5. *Results.* Despite of the economic progress of the last decade, the GoG still faces a number of vulnerabilities including: (i) strengthening the efficiency and effectiveness of public sector and (ii) harmonizing its economic growth within a framework of preservation of natural resources, which are its main asset. On that basis, the measures established by the GoG that this Program supports, are meant to update and modernize its policy framework in order to achieve the following objectives:

1. To contribute to the stimulation of economic growth of Guyana' s economy;
2. To ensure fulfillment of the commitments established in the MoU between the Government of Guyana and the Government of Norway.
3. To guide the development strategy based on a low carbon emission strategy (LCDS), prioritizing investments for that purpose and encouraging sectors that use that production logic and;
4. To deepen the sustainable management of natural resources, adapting and modernizing the control, monitoring and reporting systems, with a special emphasis on the tracking of the forest and mining sectors.

# Environmental challenges in Forestry and Mining.

* 1. *Introduction - Economic Profile.* After restructuring its debt in 2005, the country entered a phase of growth limited in scope only during the international financial crisis period. Current context presents satisfactory trends in the relevant variables, presenting in the following table a resemblance with the main indicators of the economy of Guyana.

Table 1 - Main Indicators of the economy in Guyana



Source: Bureau of Statistics of Guyana Historical Information (www.statisticsguyana.gov.gy) and Bank of Guyana (www.bankofguyana.org.gy). Projections based on IMF Reports. Monetary baseline according to ECLAC Economic Balance 2013.

* 1. The table can be explained according to the description of the indicators, grouped thematically:

1. Real Sector. The first group of indicators refers to the real economy, in which the 2006-2013 period shows an average growth rate of 4.6% annually, which, within a framework of stability, has allowed significant reconstitution of the indicator per capita (between 2006 and 2013 the GDP per capita increased 122% measured in USD).
2. Monetary Indicators. Inflation has been in the 3 to 7% range in the last 5 years, with a value of 0.9% in 2013. The forecasts for the expected rate for 2014 vary within a small range, defined by the estimates of the Bank of Guyana (3.0%, due to expected increases in food and fuel) and the IMF (5.0%). In this context, the exchange rate (Guyana Dollar/US Dollar parity) has been stable with minimal variations, which implied the reappreciation of the local currency. The IMF notes that the currency of Guyana is "moderately above its equilibrium point, though globally it is on par with external stability."
3. External Sector. The balance of payment deficit remains within the 11-16% range, and is 14.2% of the GDP in 2013. At the same time, the reserves have shown favorable growth reaching the equivalent of 23.6% of the GDP at the end of 2013.
4. Fiscal situation. Management consolidation in this area is reflected in the decrease of the fiscal deficit which dropped from 11.6% of the GDP in 2006 to 4.3% of the GDP in 2013.
   1. From a general perspective, the following table presents the participatory trend of the main sectors in the GDP.

GDP Structure in Guyana 2006-2013

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Components** | **2007** | | **2008** | | **2009** | | **2010** | **2011** | **2012** | **2013** |
| Agricultural & Livestock (exc Forestry) | 17,5% | | 19,0% | | 17,0% | | 14,7% | 15,7% | 16,0% | 16,0% |
| Forestry Sector | 3,9% | | 3,4% | | 3,5% | | 3,6% | 3,0% | 2,7% | 2,8% |
| Open-Pit & Mining Sector | 12,9% | | 14,2% | | 14,2% | | 16,0% | 19,1% | 21,3% | 18,0% |
| Manufacturing & Construction | 7,5% | | 8,3% | | 7,7% | | 6,8% | 6,5% | 6,3% | 6,7% |
| Services sector | 61,2% | | 58,4% | | 61,2% | | 62,8% | 59,8% | 57,5% | 60,4% |
| Subsidies Net taxes | -3,0% | | -3,2% | | -3,6% | | -3,9% | -4,1% | -3,9% | -4,1% |
| Total GDP | 100,0% | | 100,0% | | 100,0% | | 100,0% | 100,0% | 100,0% | 100,0% |
| **Total GDP** | **100,0** | **100,0** | | **100,0%** | | **100,0%** | | **100,0%** | **100,0%** | **100,0%** |

*Source: Bureau of statistics*.

* 1. The indicators show Services as most relevant sector (60.4% of the total from 2006 to 2013). On the other hand, the primary sectors show a decline in relative amounts (among them, the forest industry), with the exception of the mining industry, which in the last few years has taken advantage of the benefits resulting from the high international price of commodities, stimulating domestic and foreign investment. These two sectors are the center of the Bank's intervention, taking into account the impact generated by their operation conditions on the capacity of environmental offerings of the forest resource where they are based.
  2. **Environmental Challenges.** Below are two situations that require coordinated and consistent action for proper management: (i) controlling deforestation levels and (b) harmonizing growth patterns, maintaining the dynamics of economic expansion while diminishing its negative effects.
  3. Although the annual deforestation rate from 1990-2010 (estimated between 0.01% and 0.06% on average) was relatively low when compared to the majority of the tropical countries, the forests in Guyana face pressure associated with the intensification of economic activity as well as climate change. From October 2010 to December 2011 (Y2), deforestation remained relatively stable at 0.054%. From January 2012 to December 2012 (Y3), deforestation rate was of 0.079% (an estimated of 14.655 ha), which is 0.023% above the target, and 0.025% higher than the year before. According to the information from 2013 (Y4), deforestation rate decreased in 2013 to 0.068 %. Main deforestation has been the mining sector, which contribution to total loss of forest increased from 51% to 63% from 1990 to 2009 and to 91% from 2010 to 2013[[1]](#footnote-1).
  4. It is also important to note that the economic growth cited in Guyana and in particular in the mining sector has been fueled, substantively, by the high prices of gold. Due to the conditions under which this extractive industry operates, there are direct losses in terms of deforestation and degradation of the ecosystem, creating persistent impacts on nature's capacity to provide essential services. This creates a complex operating situation within the LCDS framework, expanding the sector to take advantage of its effect on the rest of the economy, keeping its negative impacts under control.
  5. Guyana is no exception with regards to its economic profile exhibiting high dependency on natural resources, like many other nations. In many regions the registered experiences contributed to defining a phenomenon known as Resource Curse. This term describes the empirical observation exhibited in various countries that had inadequate management of resources or crises caused by mismanagement of resources, in many cases with economic development below other countries that do not have said resources.[[2]](#footnote-2)
  6. The challenges created by availability of resources are substantial, which is why their management requires broad planning, with a long-term focus. Among the problems caused by mismanagement is the so called Dutch disease.[[3]](#footnote-3) This establishes that the emphasis on natural resource extraction causes a decline in internationally viable goods. The sequence is: (1) the increase in the exploitation of resources leads to an appreciation of the local currency, making exports less competitive, (2) imports are cheaper, thereby reducing the margins of other domestic sectors; (3) demand is moved to other internationally non-tradable products (construction and various services) which tends to make wages and other factors of production increase, driving down the profitability of the exportable products sector. As a result, the economy ends up being dependent on two segments: extraction of natural resources and internationally non-tradable household products.
  7. As mentioned before, the PBL aims at updating and modernizing its policy framework with the purpose of achieving the following objectives:
  8. To contribute to the stimulation of economic growth of Guyana' s economy;
  9. To ensure fulfillment of the commitments established in the MoU between the Government of Guyana and the Government of Norway.
  10. To guide the development strategy based on a low carbon emission strategy (LCDS), prioritizing investments for that purpose and encouraging sectors that use that production logic and;
  11. To deepen the sustainable management of natural resources, adapting and modernizing the control, monitoring and reporting systems, with a special emphasis on the tracking of the forest and mining sectors.
  12. It was identified that the main weaknesses are related to the previously mentioned mining and forest sectors. Because of this, the specific problems associated with the operation of the main institutions in those sectors have been identified, so as to contribute to its strengthening so the expected reforms can be established in accordance with the defined policies.
  13. Mining is the main identified sector, in which the main weakness is the impact (a) on deforestation levels and (b) pollution due to the application of inappropriate techniques (mercury use in gold mining being the most significant). The losses caused by this activity amount to 10.831 hectares per year (2010 – 2013 annual average).
  14. Gold mining activities often transfer the cost of mitigating these effects on the water to other water users, usually affecting the value of the water services at a national level. Potable water suppliers and hydroelectric plants, in particular, absorb costs linked to the increased sediment loads since this accumulation raises the cost of water processing and shortens the productive life of dams and turbines. The coastal marine systems have significant economic value due to their regulation and supply services, such as the coast protection, tourism and fishing. For some Central American and Caribbean countries, the value of the service of these ecosystems could represent 10% to 30% of the gross domestic product[[4]](#footnote-4).
  15. Also there are significant differences in comparative terms for the presence of different activities of land use. For example, the basin of Magdalena river,[[5]](#footnote-5) in full growth for the mining activity, has received a big amount of sediments due to deforestation, agriculture, livestock activity and urban expansion. The proportional amount of sediment transported or the loss of forest cover due to these circumstances is considerably less than what it is observed throughout Marowijne river in Suriname or Essequibo-Cuyuní in Guyana/Venezuela, where gold mining explains a higher proportion of the total variation of these effects. Similarly, it can have an impact on the riverside or gallery forests and in the rivers that run under its shadow, because they behave as concentrated repositories of biodiversity and local community resources in areas of savanna mosaics and forests that are located in the regions of the Brazilian shield and the Guyanese shield[[6]](#footnote-6).
  16. Gold mining is significantly affecting the freshwater systems throughout Latin America and the Caribbean, but the totality of the impact is probably felt most in the Guyanese shield region due to the reduced energy of its freshwater systems, the relative absence of other land uses, high levels of forest cover and a high incidence of oligotrophic blackwater systems[[7]](#footnote-7). Similarly, the concessions granted for gold mining upstream of hydroelectric plants run the risk of reducing the life of these plants, and among other effects, decreasing the internal return rates due to sediment accumulation. The additional pressures placed on operational performance due to lack of quality water control before it arrives at these plants can cause increases in maintenance and generation costs.
  17. The goal of the established management strategies is to support incorporation of techniques to improve productivity and to reduce deforestation rates per unit of production. As it happens with many land use activities in low lands, there are known techniques to help avoid and effectively mitigate the long-term impacts of gold mining such as sedimentation, and the over-exploitation of local resources. The challenge of the institutional program is to adapt and promote economically feasible technologies to boost low-and medium-scale activities, improving returns to producers. If this is not achieved, the effects of the well-designed rules and regulations would become irrelevant[[8]](#footnote-8).
  18. Forest Sector. The other highly significant segment is the forest sector. It is necessary to support the establishment of land use planning systems that integrate better use of terrestrial and aquatic resources in the mining, agricultural and livestock, forest and protected area sectors. There are often overlaps between the concessions, rights, mining and protected area permits, and logging and Indian reservation concessions, and agricultural tenancy in most of the countries, since the surface and subsurface rights are treated as distinct entities in the provisions of the majority of farming laws. Conflicts over soil use can create serious challenges for companies that seek to distribute products that are certified as sustainable. For example, in countries with large areas of national territory used for timber production, such as Guyana (also Venezuela and Peru, among others), that have made progress in terms of reducing the impact of timber extraction on freshwater systems, the certification of timber products coming from these areas is often dependent on the protection of those waterways.
  19. The percentage of tropical native forests being managed in the region is still too low. A report by the International Tropical Timber Organization (ITTO), published in 2006, indicated that only 6.47 million hectares, 3.5% of the forests in producing countries in Latin America and the Caribbean, are under management (ITTO 2006). With respect to comparable deforestation levels,[[9]](#footnote-9)according to the Data Center for Conservation of the UNALM, in Madre de Dios from 2000 to 2005 there was an average annual deforestation rate of 0.1037%, while from 2005 to 2010 the figure increased to 0.1498%. From 2008 to 2010, when the paving of the southern inter-oceanic highway took place and there was an increase in gold mining, the rate increased to 0.2134%[[10]](#footnote-10). The difference between these three periods is relevant, inasmuch as it determines the amount of CO2 that would not be emitted in different scenarios. There are initiatives in Peru [[11]](#footnote-11) aimed at including the recuperation of the areas under the REDD+ Program.
  20. The importance of natural forests in timber production is decreasing due to an increase in forest plantation activities, however it remains high in some countries. The natural production forests are largely managed through private long-terms concessions applied over relatively small areas, up to 200 thousand hectares (this is the modality in Guyana and also used in Bolivia and Suriname). The use of the natural forest is still largely oriented to timber production. In the case of non-timber forest products (NTFP), the majority of these are locally used, though sometimes they are sold in national and international markets as a raw material for the preparation of various products such as cosmetics and pharmaceuticals.
  21. Some of the challenges of sustainable management of the region's natural forests used for timber production are (FAO 2009): (i) lack of adoption of low impact timber extraction due to insufficient incentives; (ii) limited certified forest area due to elevated costs and the absence of subsidized prices, and especially due to the availability of illegally obtained timber at a low price; (iii) prevalence of the informal sector (especially in illegal logging and timber preparation units).

# Logic of Intervention

* 1. Following the recommendations established by IDB[[12]](#footnote-12), it is necessary to establish the economic logic of the intervention. The economy of Guyana has a production profile that is based on the exploitation of natural resources, has low human development[[13]](#footnote-13)and competitiveness[[14]](#footnote-14), but at the same time has great environmental strength. After restructuring its sovereign debt in 2006, there was an improvement in its financial profile and thus, its opportunity to access capital markets. Nonetheless, the amount of investment needed for development required very large sources of resources.
  2. In that context, in the middle of the last decade, the GoG realized that the conditions created by discussions carried out in global forums on the effects of climate change (CC), greenhouse gas emissions among them[[15]](#footnote-15), were an opportunity to obtain financing to move forward with a strategy in that area[[16]](#footnote-16). Within this framework, the central idea requires coordination of the following two aspects: (i) to make gradual progress in investments that stimulate development, redirecting soil use towards activities with greater productivity (thereby increasing the economic value to the nation - EVN) and (ii) to maintain the management of forest resources in a way that does not harm the environmental services that Guyana currently provides to the world (maintain stable economic value to the world - EVW). The challenge is coordinating both strategies. The following graphic shows the increase in development pursued.

*Restructuring of the development model*

2009 2020-2030

* 1. The GoG has advanced in the design and use of a mix of instruments, which function in a coordinated and integrated way, in order to: (i) maintain Guyana's strength as a provider of environmental services to the World, and (ii) obtain financial support from interested counterparts. As a result of this, the resources that finance the restructuring of the development model are generated, according to the guidelines and conditions of the LCDS. The said instruments are:

1. the MoU (described in Annex I) which establishes a series of commitments concerning deforestation, forest degradation, and carbon emissions and absorption, determining the financial conditions of the payments that will be received from Norway. Since the restructuring strategy requires investment in infrastructure and other initiatives linked to the promotion of innovation and private activity, restrictive policies and regulations must be set forth in the sectors with high forest impact in order to avoid the non-fulfillment of the agreement (or a decrease in the financial flow to Guyana)[[17]](#footnote-17). This is where the second focus or instrument becomes especially important.
2. The LCDS supports investments that generate economic growth, while simultaneously keeping forest management under control (as well as deforestation and degradation) and promotes the reduction of greenhouse gases. The considered and relevant measures from the economic perspective include:
   1. Investment in infrastructure with low carbon emissions, including a hydroelectric dam; facilitation of access to non-forested arable land and improvement of fiber optic provision.
   2. Promotion of investments in high potential, low carbon emission sectors (fruits and vegetables, aquaculture, eco-tourism and outsourcing).
   3. Reformation of the forest dependent sectors (mainly mining and afforestation) so that they operate under strict sustainability models.
   4. Improving the range of services and opportunities for all citizens of Guyana, including encouraging private activity, entrepreneurship and the expansion of basic social services, health and education among them.
   5. Reducing vulnerability to the effects of climate change.
3. The resources for the strategy are institutionally supported by the funds generated through REDD+, the third instrument. The agreement with Norway is being channeled through this mechanism[[18]](#footnote-18), which is basically financing (i) the investment needs for LCDS implementation and (ii) the institutional strengthening of the GoG areas for appropriate management of REDD+[[19]](#footnote-19). The mechanism will allow additional financing from other entities (IDB, World Bank, and the UNDP, among others)[[20]](#footnote-20).
   1. Aiming at maintaining the conditions of the MoU and its associated instruments in force, a group of strengthening actions are required, which are those under which this Program is structured. In this way, the fulfillment of the Policy Commitments will allow to maintain in force and deepen the strategy progress, meeting a necessary requirement to achieve the expected benefits on its economy.

### Component 1. Macroeconomic Stability

* 1. The objective of this component is to maintain an enabling environment for the generation of investments and the inflow of capitals/financial agents that maintain the important commitments that the LCDS requires.

Component 1 Commitment. *The GoG commits to maintaining a macroeconomic framework that is in accordance with the LCDS policy*. In terms of expected effects, given that due to the progress observed from 2005 to present they have attained stability, the required commitment is to maintain said stability

**Conditions/Commitments**

-Maintain a stable macroeconomic framework.

**Result**

- Conditions have been created for the stimulation of investments facilitating the objectives of LCDS

### Component 2. Regulatory Framework

* 1. The objective of this component is to modernize and adapt management practices to superior environmental standards, through the update of the regulatory framework. Given the strong impact on forest resources, the intervention is mainly concentrated on the mining and forest sectors.

Component 2 Commitment includes:

* + - In general, the implementation of the LCDS, including the two projects under the GRIF framework.
    - To support further improvements in environmental management regulations for the forestry and mining sectors, the same two forest-based high-deforestation-impact sectors as the first PBP operation, the second PBP focuses on a strengthened EPA and its regulatory framework; the implementation of Codes of Practice for those sectors in the context of a National and Regional Land Use Plans, and the development of a Draft Strategy to establish an Opt-In Mechanism that can better include Amerindian communities in decision-making and profit-sharing associated to the exploitation of natural resources in their landsFor the mining sector: (i) revising the legal and regulatory framework of the extractive sector; (ii) initiating an opportunity identification process for the implementation of the Extractive Industries Transparency Initiative (EITI) [[21]](#footnote-21); (iii) preparing a pre-candidacy for Guyana to adhere to the EITI; and (iv) studying an incentive proposal for the use of clean technologies.

**Conditions/Commitments**

- Approval and publication of the updated LCDS.

- Revision of the legal and regulatory framework of the extractive sector.

- Explore opportunities within the framework of EITI initiative and prepare the pre-candidacy.

- Assess incentives that promote the use of clean technologies in mining.

- Implementation of a Code of Practices for the clearing of forests (3rd edition).

- Continue negotiations within the framework of EU FLEGT initiative.

- Preparation of a national plan of land use.

**Results**

* Improve the capacity of sustainable management of the forest resources.
* Promotion of clean production practices.
* Promotion of transparency and integration mechanisms of public-private initiatives.
* There are advances in the creation of conditions of inter-sectoral articulation of the land use.

### Component 3. Institutional Strengthening

* 1. The objective of this Component is to improve the capacity of the public sector to contribute to the objectives defined in the LCDS. Guyana undertook a series of governance reforms from 2003 to 2011 that produced significant improvements in the quality of public expenditure and the reorganization of public finance. In this same course of action, the effective implementation of the LCDS, which involves ambitious investments in infrastructure, development of the private sector and suitable management of natural resources, requires continued improvements in the administration.

Component 3 Commitment includes:

• In general, strengthening the capabilities of the MoNRE.

• The actions planned to this end are: (i) a viable Monitoring and Evaluation framework, aided by an operational GIS structure that would permit close follow-up of the coherent implementation of MNRE policy by its Commissions –particularly the GFC and the GGMC; (ii) the implementation of a National Action Plan as required by the Minamata Convention and initial operation of its associated dedicated Fund for the promotion of mercury-free mining in Guyana (which would be a significant achievement to support the enforcement of Guyana’s commitments under Minamata); (iii) the initiation and implementation of a process toward candidate-status and compliance with EITI; (iv) an institutionalized system to deal with issues related to indigenous communities and their association to the forestry and mining operations, including benefit-sharing mechanisms such as those mentioned under Component 2; and (v) the strengthening and consolidation of overarching capacities on environmental compliance and enforcement of EPA.

**Conditions/ Commitments**

- Preparation of a Strategic Plan of the MoNRE.

- Launching of the adaptation strategy to CC.

- Training programs conducted by the MoNRE on best practices in mining, sustainable forest management and inter-agency coordination (land uses).

**Results**

- The capacity of the MoNRE to carry out its responsibilities in the LCDS framework is strengthened.

### Component 4. MRV System.

* 1. The objective of this component is to make a contribution of the system to the management of the resources with forest base. Advances achieved by strengthening the capacities of Guyana to manage the forest resources through an appropriate management evaluation and planning, as well as permanent monitoring of the degradation and deforestation levels[[22]](#footnote-22).

Component 4 Commitment includes:

• In general, providing basic instruments and then strengthening the monitoring and evaluation system.

• Specifically, this component seeks that carbon emissions and removals be reported consistently and with IPCC guidance; the integration of forest cover data from all MNRE agencies; and the integration of forest degradation information into the MRVS.

**Conditions/Commitments**

- Approving the instruments that measure carbon emissions and implementing the forest cover database.

- GFC prepares studies relating to the forest cover (modifications 2011-2012) and to the factors that have an impact on the carbon emissions levels.

**Results**

- The capacity of GFC to conduct the appropriate monitoring is strengthened with the purpose of controlling the fulfillment of the commitments established in the MoU with Norway.

### Expected impacts and results at Program level.

* 1. From the joint effects of the different components, it is expected that the Program as a whole contributes to the following:

1. In terms of impacts: (i) sustain the annual rate of deforestation at an annual maximum level of 0.056% to fulfill the commitments of the MoU, maintain the logic of the strategy and continue receiving the resources to finance the restructuring process toward an economy with low carbon emissions (ii) increase annual exports of forestry sector from USD 39.1 Million (baseline) to USD 44.5 Million (2016 target).
2. In terms of contribution to public capacities of management, contribute so the institutions of GoG as well as the regulatory frameworks promote the objectives and guidelines of the LCDS. This includes:
   1. Strengthening the regulatory framework and making progress in the policies,
   2. Strengthening the MoNRE through the promotion of its Strategic Plan and,
   3. Making progress in the effectiveness of the monitoring, verification and reporting system related to forest cover and carbon emissions levels.

# Monitoring.

* 1. Since it is a PBP, the policy commitments that represent the products of the project must have been fulfilled before the disbursement of the operation. This means that the monitoring process takes place before the execution, which implies the data collection that allows that verification, the budget for the monitoring, the work plan and any other necessary element must be agreed and executed before the disbursement of the loan.
  2. Because of that, this section is limited to the presentation of the products and its verification means.

### Policy Conditions/Commitments and Means of Verification

* 1. For a PBL, the products correspond to the policy commitments and the indicator of its fulfillment is represented by the established mean of verification. As these commitments must be already covered, it makes no sense to include the frequency of measurement

# Impact Assessment.

### **Impact Indicators**

* 1. Conditions to be applied on the indicators. The Toolkit DEM requires the establishment of at least one indicator for each type of expected impact or result established in the matrix (at least one per component should be included). At the same time, the classical requirements that allow to reach the SMART (Specific, Measurable, Achievable, Realistic and Time-bound) category are maintained, and in addition:

1. Each indicator has a base line (a point of comparison from which to establish its performance on a comparative basis).
2. Each indicator has a target or objective value, which constitutes the reference of expected success level in a time frame.
3. Each result indicator establishes an expected value for the end of the objectives of the project, as well as intermediate values of annual frequency.
4. Each indicator has a source for provision of data, or in its absence, a strategy for the collection of data.
   1. This section includes all impact indicators and results which will be measured during the implementation of the program, the formula and the measurement methodology and the means of verification for each of the indicators.

Matrix of Indicators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Impact & Results | Indicator | Baseline | Target (2016) | Verification Means |
| Impact: Annual deforestation rate: 0.056% sustained GFC technical reports.  Annual exports forestry sector (USD Millions) 39.1 44.5 Bank of Guyana | | | | |
| Results:  Governance and policy framework that support the implementation of the LCDS strengthened | * Policy and regulatory framework enhanced | * LCDS version 2010 * Limited environment regulations for extractive industries | * LCDS 2013 update * Environment regulations for extractive industries reviewed/approved | * Press release * Reports |
| * MNRE strengthened by implementing its strategic plan | * MNRE does not have a strategic plan | * MNRE strategic plan approved and implemented | * Document of Strategic Plan * Reports on progress |
| * MRVS operative | * MRVS in start-up phase | * MRVS issues carbon impact, carbon stratification & carbon expansion assessments | * Reports of MRVS |

**COMPONENT RESULTS & INDICATORS**

| Component | Indicators | Baseline  2013 | Targets | | | | Verification Means |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2013 | 2014 | 2015 | 2016 |
| 1. Macro-economic stability | Result 1: Continued macro-economic stability | | | | | | |
|  | Technical opinion IMA | Stable macro-economic framework | Continued | Continued | Continued | Continued | IMA annual report |
| 1. Regulatory framework | Result 2: LCDS implemented | | | | | | |
|  | LCDS update process completion | Draft | 1 update  2 GRIF projects implement-ed |  | 2 GRIF projects implement-ed |  |  |
|  | Consultations on LCDS and reviews by MSSC (*Multi-Stakeholder Steering Committee)* | 0 | # MSSC meetings | # MSSC meetings | # MSSC meetings | # MSSC meetings | Press release  Minutes of MSSC meeting |
|  | Result 3: Forestry & Mining sector have improved environmental management and law enforcement | | | | | | |
|  | Review and application of environmental regulatory framework for extractive industries | Forestry Act is current; most forest regulations up to date | 1 Review  1 Scoping study | 1 Review EPA regulations for SEA  2 reviews of safeguards (forestry & mining) | 1 Act (forestry or mining) revised regulations  1 Opt In proposal complete  1 National Land Use Plan complete  1 review country safeguards system  1 Protected Areas Act amended | 1 Opt In system in place  1 country safeguards system in place | Reports |
|  | Operational market-based mechanisms | Initial approach to Extractive Industries Initiative (EITI) | 1 country pre-candidacy for EITI  Code of Practice into force | Code of Practice applied in 50% of concessions |  | Code of Practice applied to 100% of concessions | Press release setting up EITI Multi-Stakeholder group |
|  |  | 0 | 1 report on technological improvements for extractive sector |  |  |  | Letter by the Minister of NRE attesting to the receipt of the study. |
| 1. Institutional strengthening | Result 4: MNRE has a Strategic Plan that provides for adequate inter-agency coordination and oversight to accomplish LCDS objectives | | | | | | |
|  | Strategic Plan detailing adjustments to: (i) create Planning & Policy Unit; (II) create Coordination Unit to cover existing agencies under MNRE; (III) create mechanisms for effective coordination between extractive sector-related agencies | Draft | 1 Strategic Plan submitted | 1 Strategic Plan approved | Strategic Plan implemented: (a) communi-cation protocols GGMC-GFC; (b) organiza-tional chart with coordination systems; (c) SLUC with coordination procedures; (d) communication protocol with indigenous groups | 1 report on workings of integrated access system for forestry & mining concessions  1 report on integration of forest cover data among agencies | Record of formal submission of Strategic Plan to Minister  Report on Strategic Plan approval  Technical reports |
|  | Adoption of knowledge-based mechanisms to improve environmental management of forest-based sector | 0 | 1 training program on best-practices for mining  1 design of courses on EIA  1 draft National Log Tracking System | 1 Log Tracking System approved | 1 report on adoption of new tech-nologies & best-practices adopted | 1 report on progress in adoption of new technologies and best-practices | Technical reports  Records from MNRE, GGMC, GFC |
| 1. MRVS | Result 5: MRVS capable of generating country-wide, verified reports on forest cover and deforestation drivers | | | | | | |
|  | Tools for Carbon Impact Assessment for main drivers developed, and Forest Cover database prepared | 0 | 1 Carbon Impact Assessment tool for main drivers approved  Report on forest area changes 2011-2012; Assessment report on forest carbon stratification; Report on carbon conversion and extraction | 1 report following up progress towards reduced deforestation and forest degradation | 1 report on forest carbon emissions and removals with IPCC guidance  1 report on forest degradation | 1 report following up progress towards reduced deforestation and forest degradation  1 report on integration of forest cover data from all MNRE agencies | Record of decision of approvals by GFC  Technical reports |

### **Impact Assessment Methodology.**

* 1. As was previously explained, the Program seeks to support the fulfillment of the commitments undertaken by the GoG in the framework of the MoU signed with Norway, through the contribution of the expected activities in the different components, as well as the need of institutional strengthening required for the maintenance of the REDD+ mechanism. Specifically, from this progress it is expected that GoG: (i) continues receiving the financial support that Norway has promised, subject to the fulfillment of the sets of established indicators, (ii) expands the use of REDD+ mechanism, incorporating other counterparts and financial support, (iii) progresses in the implementation of LCDS, consolidating a model of sustainable management.
  2. There is no doubt that the objective of the program is to contribute to create the conditions that allow progress in the bilateral agreement and thus maintain the financial conditions that allow Guyana to move forward in the investments expected in the LCDS, the fulfillment of these objectives goes beyond the scope of the actions of the Program. Although the contribution of the Program represents a necessary condition for the continuity of the process (without it the LCDS loses its condition of effectiveness) the future progress requires a set of additional resources and complementary actions to achieve the results expected in the long term. That being said, which represents a limit to the criteria of attribution of results to an initiative, what can undeniably be established is the additionality nature. This is, the expected benefits and impacts will take place only after the actions planned by the Bank in the framework of this Program are executed. It is worth noting that the methodology is coherent with the guidelines established in the Toolkit[[23]](#footnote-23) developed by SPD for the preparation and evaluation of projects.
  3. **Methodology.** In the definition of incremental benefits of a project, the critical element is the correct definition of the scenarios With and Without Project. At the same time, there is a wide range of alternate methodologies or approaches to build the Without Project scenario. Although some methodologies are a priori superior than others, allowing to reach better measurements of effective impacts, not all projects admit the election of the alternative which would be the technically eligible. In the present case, the comparison with a counter-factual is not applicable, given the extremely unique and differentiated characteristics of the Program (at a national level based on an absolutely innovative and original initiative.) That is why the use of the *before* and *after* mechanism is recommended, comparing the indicators established in the base line with those gathered ex post without specific attribution of results found.
  4. The *Before-After* methodology (or with and without project) does not allow progress in terms of attribution. It is a strategy with the simplest application, suggested given the impossibility of identifying a valid contra-factual for the purposes of another type of comparison that can disintegrate the derivative impacts of other variables not observed. Although the method is based on the simple evaluation of the selected indicators, it must be complemented at a later stage with the analysis of complementary information that allows a constructive discussion in terms of causal relationships with the observable behavior of other relevant variables of the context.
  5. The evaluation of closure of the Program will be performed at the end of the disbursement of the Program, according to the usual regulation. However, for the purposes of obtaining an appropriate understanding of the success achieved , it would be convenient for the Impact Assessment to be performed at least two years after said date. From the perspective of operation learning, its analysis should be focused on several aspects to measure its effectiveness. (i) impacts and results of the restructuring of the productive model of Guyana, (ii) impacts on the sustainability of the forest resource, (iii) level of success reached by the REDD+ mechanism to be copied on other sites and/or with other beneficiaries. While the impacts on economy will be noticeable in the long term, the results obtained in terms of regulations or strengthening can be verified in the short term, contemporaneously with the Final Evaluation of the PBP. On the other hand, the interpretation regarding the capacity to structure financing intended for the reduction of the effects of climate change (CC) allows an annual verification, that is established on quantitative aspects (channeled resources), as well as on a wide and qualitative view of the overall process.
  6. The Implementing Body of PBP shall be responsible during the implementation period, of collecting and maintaining the data that allow the Bank to conduct the referred follow-up and, at the time, perform the expected ex post evaluation.

### **Impact Assessment Budget**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity** | **Year** | **Responsible** | **Cost** | **Resources from** |
| Impact Assessment Report | 2017 | Individual Consultant | USD $30.000 | IDB |

***Bibliography***

ECLAC. An assessment of the economic impact of climate change in Guyana. 2011.

ECLAC. Economic Balance in Latin America and the Caribbean 2013. April 2014.

Humphreys, M., J. Sachs, and J. Stiglitz, What is the Problem with Natural Resource Wealth?, in Escaping the Resource Curse, M. Humphreys, J. Sachs, and J. Stiglitz, Editors. 2007, Columbia University

Guyana Bureau of Statistics. 2013 and 2014. Bank of Guyana (www.bankofguyana.org.gy).

Guyana REDD+ Monitoring Reporting & Verification System (MRVS). GFC. Year 1-3. Final Report. Year 4 Interim Measures Report. Press Release. October 2014: Georgetown, Guyana.

Human Development Index, United Nations. 2013.

IDB. Toolkit for the Application of the DEM Sovereign Operations. SPD. January 2013

IDB. Instruments and development: An evaluation of the operational modalities of the IDB loan. *Office of Evaluation and Supervision, IDB 2004.*

IDB Technical Note . Management of the Impact of Open-Pit Mining Operations on Fresh Water in Latin America. Hammond, Rosales and. Ouboter. March 2013.

IDB.Toolkit for the Application of the DEM Sovereign Operations. SPD. January 2013.

IMF. World economic outlook. Abril 2014.

Strategic Framework for the Ministry of Natural Resources and the Environment 2013-2018. April 2013. SEA.

Swenson, J.J., Carter C.E., Domec J.C. and C.I. Delgado. 2011. Gold mining in the Peruvian Amazon: global prices, deforestation, and mercury imports.

WEF. The Global Competitiveness Report 2012--2013.WEF



# Appendix: Impact Evaluation Consultancy TOR

**ENVIRONMENT SECTOR STRENGTHENING – I and-II (GY-L1039 and GY-L1043)**

**Terms of Reference – Impact Evaluation Consultancy**

1. Background

The economic structure of Guyana exhibits a noticeable dependency on its natural resources. As part of the Low Carbon Development Strategy (LCDS), approved in 2009 and amended in 2013, the Government of Guyana is highlighting the importance of environmental protection for long-term sustainable development. The strategy has three important components: (i) financing low carbon emission strategies with the majority of the financial resources being provided through the Memorandum of Understanding (hereinafter MoU) signed between the governments of Norway and Guyana in 2009, in which the government of Norway commits to providing US$ 250 million in 2015, which will be managed within the framework of the Guyana REDD+ Investment Fund; (ii) the creation of a low carbon emission economy, including applying reforms to the forest and mining sectors; and (iii) developing an economy resistant to the effects of climate change through prioritized investment in infrastructure.

Within this context, the Environment, Rural Development and Disaster Risk Management Division (RND) of the bank is making progress in the preparation of a Policy-Based Programmatic Serie (PBP), Strengthening the Environmental (Sector GY 1039 and GY 1043). The objectives of this Program are to promote: (i) greater macroeconomic stability, (ii) a suitable regulatory framework, (iii) institutional strengthening of the Government of Guyana's capacity to handle environmental issues, and (iv) efficient monitoring and development of information and verification systems.

1. Objectives of the consultancy

The main objective of the Impact Evaluation Plan is to determine whether the interventions and policy reforms supported by the Program Strengthening the Environmental (Sector GY 1039 and GY 1043) successfully achieved its expected impacts and results.

General Objective:

1. Conduct an Impact Evaluation for IDB review and submission to the GoG. It has been agreed that the most appropriate evaluation for this programmatic series is the method of Reflective Evaluation, which compares the indicators baseline (before and after), without attributing the ex post results to the specific intervention of the project

Specifics Objectives:

From the perspective of operation learning, its analysis should be focused on several aspects to measure its effectiveness.

1. impacts and results of the restructuring of the productive model of Guyana,
2. impacts on the sustainability of the forest resource,
3. level of success reached by the REDD+ mechanism to be copied on other sites and/or with other beneficiaries.
4. Metodology

The *Before-After* methodology (or with and without project) does not allow progress in terms of attribution. Although the method is based on the simple evaluation of the selected indicators, it must be complemented at a later stage with the analysis of complementary information that allows a constructive discussion in terms of causal relationships with the observable behavior of other relevant variables of the context.

The following questions will be used by the consultant to guide the evaluation process.

* Has the LCDS been further updated? If so, have the changes introduced followed along the same conceptual lines as the 2013 version, used as basis for the loan operation?
* Have the participation and consultation processes to which the LCDS have been subject resulted in some changes in the orientation of the Strategy, so as to accommodate the opinions and perspective of those consulted?
* Do Amerindian organizations feel they have been listened to and have had substantive participation in the design and implementation of the LCDS?
* Do the personnel in decision-making positions at MNRE believe the Ministry has been strengthened and is currently able to perform its coordination functions effectively?
* Have the GFC, GGMC and EPA adopted clear environmental guidelines for the forestry and mining sectors, directed towards reducing deforestation and forest degradation?
* Have the GFC and GGMC (and EPA, when appropriate) been able to enforce the new regulations? What have been major obstacles, or major progresses attained?
* Is the MRVS system operational and widely used by GoG agencies to track changes in forest cover?
* Has the Government of Norway approved the remainder of funds committed under the MoU with the GoG? Completely or partially? Which factors or reasons have affected this outcome?

1. Activities

The consultant will be responsible for the following activities:

1. In direct coordination with sector specialists, review the documentation for the execution of the two operations of the program. In particular, assess the scope and impact achieved according to the targets and indicators in the Policy Matrix and the Results Matrix.
2. In direct coordination with sector specialists, meet with major stakeholders (IDB, GOG and NGOs) to review successes and shortcomings from execution of PBP.
3. Review documentation of the implementing agencies and other stakeholders to complete the required information for the preparation of Impact Evaluation.

For the purpose of conducting the evaluation, the consultant will conduct interview with relevant stakeholders and use previous assessments as reference material.

1. Evaluation schedule.

Impact Evaluation is expected to be conducted in 2017, two years after last disbursement of PBP-2.

1. Expected Outputs

The consultant will be responsible for delivering the following products:

A Draft Impact Evaluation Report, including all areas specified in the format, with special emphasis on the project impacts and results. This will be reviewed and commented by the GOG and the Bank team (60 days after signature of contract).

B Final Impact Evaluation Report, addressing previous comments (90 days after signature of contract).

1. Payments

Duration: from the signing of the contract for a period of 30 non-consecutive days.

Payment: the consultant will be paid in the following manner:

1. A first payment of 20% of the contract amount 15 days after signing it;
2. A second payment 40% upon delivery and acceptance by the Bank of the Draft Impact Evaluation Report;
3. A third payment 40% upon delivery and acceptance by the Bank of the Final Impact Evaluation Report.
4. Characteristics of the consultancy

* Consultancy type: Individual.
* Duration: from the signing of the contract for a period of 30 non-consecutive days.
* Place of work: Place of residence (23 days) and Guyana (7 days).
* Qualifications: The consultant must have an advanced degree in Economics, Public Policy or a related field and at least 8 years of experience working in the preparation and monitoring of projects in the public sector.
* Idioms: Fluency in English required.
* Budget: the total cost of the consultancy should not exceed US $ 30.000, including all travel and other expenses incurred by the consultant.

1. Supervision.

The consultancy will be coordinated by Helena Landázuri de Piaggesi, (INE/RND), Team Leader of the operation.

1. Guyana REDD+ Monitoring Reporting & Verification System (MRVS). GFC. Year 1-3. Final Report. Year 4 Interim Measures Report. Press Release. October 2014: Georgetown, Guyana. [↑](#footnote-ref-1)
2. Humphreys, M., J. Sachs, and J. Stiglitz, *What is the Problem with Natural Resource Wealth?*, in *Escaping the Resource Curse*, M. Humphreys, J. Sachs, and J. Stiglitz, Editors. 2007, Columbia University [↑](#footnote-ref-2)
3. Ebrahim-zadeh, C., Dutch disease: Too much wealth managed unwisely. Finance & Development, 2003. [↑](#footnote-ref-3)
4. The Economic Contribution of Belize's Coral Reefs and Mangroves. WRI Working Paper. Washington, DC: World Resources Institute. [↑](#footnote-ref-4)
5. Main waterway of Colombia. [↑](#footnote-ref-5)
6. Management of the Impact of Open-Pit Mining Operations on Fresh Water in Latin America. Hammond, Rosales and. Ouboter. March 2013. IDB Technical Note. [↑](#footnote-ref-6)
7. Idem. 40. [↑](#footnote-ref-7)
8. Idem. 40. [↑](#footnote-ref-8)
9. The region of Madre de Dios in Peru is a part of the Amazonian basin, the zone with the greatest amount of tropical forest in the world. Using satellite images from NASA, investigators at Duke University were able to observe the increase in deforestation due to artisanal gold mining in Peru. According to the study, two mining sites generated the loss of 7,000 hectares of forest. Source: Swenson, J.J., Carter C.E., Domec J.C. and C.I. Delgado. 2011. Gold mining in the Peruvian Amazon: global prices, deforestation, and mercury imports. [↑](#footnote-ref-9)
10. WWH June 2013 based on information cited in43. [↑](#footnote-ref-10)
11. Bosques Amazónicos (BAM) is a private sector company established in Peru in 2004 dedicated to the development of forest projects in the Amazon. Currently, the producers sell most of their timber in the local markets in the form of planks, which are sold at very low prices due to their basic quality. The project seeks to reduce deforestation through three lines of activities: (1) Establishing a processing plant with the latest technology (majority owned by the concessionaires) that improves quality and obtain products with greater added value. As a result, it is expected to duplicate the income of the producers, which would allow them to protect their forests and reduce the amount of timber extracted, (2) Financing FSC certification for all the concessions and activities related to reforestation and enrichment, (3) Implementing a monitoring system that allows early detection of deforestation risks. [↑](#footnote-ref-11)
12. Toolkit for the Application of the DEM Sovereign Operations. SPD. January 2013. [↑](#footnote-ref-12)
13. No. 121 out of 187 countries, according to the Human Development Index, United Nations. 2013. [↑](#footnote-ref-13)
14. No. 102 out of 142 countries, according to The Global Competitiveness Report 2012--2013.WEF. [↑](#footnote-ref-14)
15. UN Framework convention on Climate Change ([www.unfccc.int](http://www.unfccc.int/)). In view of the Convention, industrialized countries commit to supporting activities related to climate change in developing countries, offering them, among others, financial support without affecting other type of aid. A system of donations and loans has been established. It is managed by the [Global Environmental Fund](http://www.thegef.org/gef/node/2492). In the early years of the Convention, adaptation received less attention than mitigation, since the parties wanted to have greater certainty of the vulnerability to climate change and its impacts. When the third Intergovernmental Panel on Climate Change (IPCC) evaluation report was published (2001), adaptation began to receive more attention, and the parties agreed on a process to deal with adverse effects and establish ways of financing the process. [↑](#footnote-ref-15)
16. The considerations related to the proper assessment of the opposed exploitation models (Economic value to the nation vs. Economic value to the world) at the time that the Guyana-Norway agreement was signed are not the focus of analysis of this document. [↑](#footnote-ref-16)
17. The GoG notes that the success of the initiative would be a successful model that can be replicated at other sites for the development of the REDD+ mechanism within the framework of climate change strategy. [↑](#footnote-ref-17)
18. Norway has contributed USD $70 million to the fund up to December 2012 and it is estimated that an additional USD $100 million would be disbursed this year. [↑](#footnote-ref-18)
19. The United Nations Framework Convention on Climate Change (UNFCC) has agreed upon measures to promote the reduction of emissions, deforestation and forest degradation using the REDD+ mechanism. [↑](#footnote-ref-19)
20. Two projects financed through this instrument with the participation of the IDB have been approved. [↑](#footnote-ref-20)
21. Extractive Industry Transparency Initiative. [↑](#footnote-ref-21)
22. To that end, Pöyry was contracted in 2011 to develop a model under the Itto Reddes Program. [↑](#footnote-ref-22)
23. DEM Toolkit for the Application of the DEM Sovereign Operations. SPD. January 2013. [↑](#footnote-ref-23)